Some lessons for policy makers who deal with the mixed blessing of capital inflows

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I. INTRODUCTION

I do not dare state that they are simple; there isn't anywhere on earth a single page or single word that is, since each thing implies the universe, whose most obvious trait is complexity.

Jorge Luis Borgés

Preface to to *Doctor Brodie's Report*, p. 9.

The experience of the past decade attests that international investors have considerable resources at their command in the search for high returns. While they are willing to commit capital to any national market in large volume, they are also capable of withdrawing that capital quickly. Movements of such funds--whether in or out--can have significant macroeconomic consequences--the latest reminders of which are the events in Mexico in 1994 and 1995 and in Asia this year. The richness of this experience--shared by highly heterogeneous developing countries and economies in transition in Asia, Eastern Europe, the Former Soviet Union, Latin America, and parts of Africa and the Middle East--provides us with the opportunity to draw tentative lessons for policy makers coping with a world of increasingly integrated capital markets.

Our first lesson is that attracting global investors' attention is a mixed blessing. Capital inflows provide important support for building infrastructure and harnessing natural and human resources. At the same time, surges in capital inflows may distort relative prices, exacerbate weakness in a nation's financial sector, and feed asset-price bubbles. Our review of the record of policy responses to capital inflows suggests that policy makers recognize these tensions. A *capital inflow* represents an increase in the demand for a country's assets--hence, in the absence of policy intervention, the currency tends to appreciate on foreign exchange markets. Yet, most of the developing countries that received sizable capital inflows during the first half of 1990s actively resisted the nominal exchange rate appreciation, albeit to varying degrees. This reluctance to allow market forces to take their course has had various rationales, including the authorities' explicit commitment (or the less explicit desire) to maintain a fixed exchange rate, a general perception that the inflows are a temporary phenomenon, or an attempt to prevent or delay a real exchange rate appreciation (so as to maintain international competitiveness). Often voiced among policy circles has been the view that an important share of these cross-border financial flows has been short-term and volatile. From that perspective, a flood of "hot money" could add to the vulnerability of the financial sector, particularly if the domestic banking system were playing a dominant role in intermediating these flows.

The recent record also shows that these multiple concerns have produced multiple responses to capital inflows (as discussed in Calvo, Leiderman, and Reinhart, 1993 and 1994; Schadler et. al, 1993; and Montiel, 1995). This paper catalogues nine such policy responses.

- The policy of first recourse across countries and over time has been *sterilized intervention.*1/ To avoid some (or all) of the nominal exchange rate appreciation that would have resulted from the capital inflow, monetary authorities have tended to intervene in the foreign exchange market. The result of that intervention was an accumulation of foreign exchange reserves. To offset some or all of the monetary expansion associated with the purchase of foreign exchange, central banks have most often opted to sell Treasury bills or (central bank paper)--but in many cases these open market operations were complemented by increases in reserve requirements (see Reinhart and Reinhart, 1997) and shifts of government deposits (or other such funds) from the banking system to the central bank.
- *Fiscal austerity measures*, particularly on the spending side, have attempted to alleviate some of the pressures on the real exchange rate and to cool down overheating in the economy, the effectiveness of which was magnified when expenditures fell heavily on nontraded goods. Furthermore, fiscal surpluses deposited at the central bank has helped "sterilize" the expansive monetary effects of foreign exchange purchases.
- *Trade liberalization* has been accelerated in some cases, in the hope that productivity gains in the nontraded sector could dampen pressures on the real exchange rate. Moreover, reducing distortions associated with controls on trade may temporarily widen the current account deficit--effectively absorbing some of the inflows without boosting domestic demand.
- *Liberalization of capital outflows* has also been a popular response to rising capital inflows. By permitting domestic residents to hold foreign assets, the conventional wisdom holds, gross outflows would increase--thereby reducing net inflows (as in Laban and Larrain, 1994).
- Various forms of *controls on capital inflows*--whether in the form of taxes, quantitative restrictions, or in the guise of "prudential measures"--usually imposed on the financial sector have also been implemented; most of these were aimed at deterring short-term inflows. In addition, (as argued by Budnevich and Cifuentes, 1993) by introducing these capital controls,

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1/ To our knowledge, Argentina is the only country in the recent inflow episode that did not attempt to sterilize any part of its foreign exchange market intervention.

some measures of short-run monetary independence may be gained, even with a relatively rigid exchange rate regime.

- *Revaluation of the nominal exchange rate* has also been restored to, particularly as inflows became persistent and curtailing the monetary expansion associated with the accumulation of foreign exchange reserves became increasingly difficult and costly. In some cases, the authorities reached the conclusion that, if an appreciation of the real exchange rate was inevitable, it was better that it occur through a change in the nominal exchange rate than through a pick-up in domestic inflation.
- *Greater exchange rate flexibility*, as in the case of a revaluation, allowed adjustment to take place through the nominal exchange rate rather than through domestic prices. However, unlike discrete revaluations in the context of an exchange rate peg or a crawl, greater flexibility increases the independence of the domestic monetary authorities and introduces or increases short-run exchange rate risk. The presence of (or increase in) such risk, it is argued, acts as a deterrent to short-term speculative inflows.
- Less conventional measures that have aimed to *curb customer credit and consumption* have been imposed as countercyclical policies in a number of countries. In most cases, these policies targeted consumption of durable goods.
- In the last leg of the inflow episode, some countries--particularly in East Asia--enacted *prudential measures* to curb the exposure of the domestic banking sector to the vagaries of real estate prices and equity markets. Judging from the scope and depth of the banking crises in several Asian countries, though, these measures may have arrived too late.

Often, policy makers have resorted to some combination of these policies. Another lesson of this paper is that the law of unintended consequences has not been repealed. Multiple policy responses to capital inflows have tended to interact in ways that were probably not anticipated by the framers of such policies. Three examples make this point clear.

- The Mexican mix observed from 1990 to 1993 kept the value of the peso very stable in the short run, sterilized foreign exchange intervention, and allowed international investors free reign in the home market. Unfortunately, these policies combined to attract an even larger volume of short-term inflows, as international investors were lured by short-term dollar returns that were made more attractive by the predictability of the near-term value of the peso and the effect of sterilization operations that boosted domestic rates.

- Brazilians brought together sterilized intervention and controls on inflows in 1994 and 1995. However, the comparatively high interest rate differentials that usually accompany sterilization probably acted as an inducement to circumvent the capital controls.
- East Asians altered the effectiveness of liberalizing controls on outflows to reduce net capital inflows by engaging in sizable sterilized intervention at the same time. The high domestic interest rates kept capital at home and may have attracted more inflows as they were interpreted as a positive signal of the future economic environment (as was the experience in Malaysia and Thailand).

The evidence is not just anecdotal. Examining the impact of sterilization policies and capital controls on the volume and composition of capital inflows for a panel of 15 capital-importing countries, Montiel and Reinhart (1997) find systematic evidence that sterilization policies increased the overall volume of capital inflows and skewed their composition toward short maturities.

Because sterilized intervention is the most universal policy response, the next section reviews the varied forms this policy has taken. The impact on interest rates, spreads, and the level and composition of capital flows is also discussed. Section III focuses on two exchange rate policies: a realignment of the exchange rate while maintaining the prevailing exchange rate regime and a change in the exchange rate regime altogether. The fiscal policy response to rising capital flows, as well as the implications it has for the conduct of monetary policy, are covered in the next section. Section V examines policies that affect the capital account, such as the liberalization of capital outflows and policies to discourage inflows. Issues related to the interaction of these policies are addressed in the final section.

II. STERILIZED INTERVENTION

The aims of sterilized intervention are twofold. The intervation in the foreign exchange market is designed to prevent, or at least damp, nominal exchange rate appreciation. Meanwhile, an accompanying sale of securities in the domestic open market drains domestic reserves so as to offset the effects on total reserves--and hence the money supply--that would otherwise ensue from the central bank's accumulation of foreign exchange reserves.

While the mechanics are clear, the motive for this policy is less so. Among the many contributions of Robert Mundell is the observation that, when capital is perfectly mobile internationally and assets completely substitutable, sterilized intervention can have no impact on the exchange rate (Mundell, 1963). Subsequent research has offered some mechanisms through which

sterilized intervention can have real consequences. Mussa (1981) suggests a role for signalling. While the intervention, per se, is inconsequential, it may be the harbinger of policy action that will have more weight, such as future changes in domestic reserve market conditions. Reinhart and Reinhart (1997) point out that often injections of reserves acquired in foreign exchange operations are offset by changes in reserve requirements, not open market operations. In that case, there may be real effects because reserve requirements are a tax that distorts deposit or lending rates.

In general, the empirical evidence of the effectiveness of sterilized intervention in industrial countries is mixed. Some studies (Obstfeld, 1990) argue intervention has not played an important role in currency realignments in recent years, while others (Dominguez and Frankel, 1993, for instance) conclude that it has.1/ Studies of developing countries have more often concluded that sterilization has a short-run effect (i.e. changes in domestic credit are not instantaneously offset by changes in net foreign assets).2/ However, other studies have found evidence of high capital mobility in the developing countries that have experienced heavy capital inflows, thus casting greater doubts on their ability to have any effect from their efforts to sterilize (see Frankel, 1994a). In any case, there appears to be little room for sterilization policies to have a sustained consequence.

Frankel (1994b) analyzed the conditions under which sterilization of capital inflows raises domestic interest rates or simply prevents them from converging to international levels. For instance, domestic interest rates would rise if the domestic-currency assets investors want to hold (i.e. bank CDs, stocks, bonds) are poor substitutes for short-term central bank paper or treasury bills being supplied by the central bank. To induce investors to hold the increased supply of short-term paper, the price of this paper has to decline and yields increase. Also, interest rates could rise if the demand for money rose, due say to a successful reduction in inflation or higher income. By sterilizing, the monetary authorities are not accommodating the increased demand for money and, hence, forcing the money market to clear at a higher interest rate. Calvo (1991) stresses the potential quasi-fiscal losses associated with sterilization, as the central bank acquires relatively low-yield foreign exchange reserves and issues high-yield sterilization bonds. Focusing on the experience of Colombia in 1991, a recent study cautioned that large-scale sterilization policies could lead to higher domestic short-term interest rates and wider differentials vis-a-vis international interest rates, promoting further inflows of short-term capital (see Calvo, Leiderman, and Reinhart, 1993).

1/ Taylor (1993) provides a review of this literature

2/ See Schadler et. al (1993).

The remainder of this section analyzes the recent experience of several countries where sterilization intervention was a central policy response to the surge in capital inflows. The focus is on episodes where the timing of the policy changes is relatively well defined.1/ However, because sterilization policies have taken a variety of forms, it is necessary first to catalogue its possible manifestations. Specifically, we consider three types of sterilization policies: open market operations, reserve requirement changes, and the management of government deposits.

1. Open market operations

Sterilization through open market operations has usually meant that the central bank sells either government securities, such as Treasury bills, or its own paper to offset the effect on domestic reserves of the purchase in the market of foreign currency--usually U.S dollars. Mexico, for instance, sterilized through central bank sales of government debt--CETES and TESOBONOS. In many countries, including Chile, Colombia, Indonesia, Korea, and the Philippines, the central bank issued its own debt for the purposes of draining domestic reserves from the banking system. In some instances, (Malaysia and Sri Lanka), open market operations were initially conducted by selling public sector debt until the central bank depleted its holdings of government debt--either because of the large scale of the sterilization effort or because new issuance dwindled as public finances were consolidated--at which point the central bank began to auction its own debt (Table 1. *Open market operations*

Some analysts have argued that the main advantage of sterilization through open market operations is that it offers a viable way of curtailing monetary and credit expansion without levying a heavier tax burden on the banking system and inducing financial disintermediation, as occurs when reserve requirements are increased (see Calvo, Leiderman, and Reinhart, 1994). The main disadvantages are that it may entail sizable central bank costs, even in a relatively short period of time.2/ Moreover, sterilization may increase the spread of domestic over international interest rates sufficiently so as to attract *more* short-term capital. Despite these drawbacks, sterilization may be

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1/ See Folkerts-Landau et al. (1994).

2/ Rodriguez (1992), suggests that the central bank losses associated with Colombia's sterilization efforts during 1991 amounted to 0.5 to 0.7 percent of GDP. Kiguel and Leiderman (1993) indicate that during 1990 to mid-1992 Chile's central bank losses due to sterilization policies were about 1.4 percent of GDP. Gurria (1993) estimates that the quasi-fiscal losses for Mexico were in the 0.2 to 0.4 percent per annum range during the 1990-1992. Central bank losses in Indonesia, Malaysia, and Sri Lanka have also been nontrivial.

warranted if there are concerns that the banking system is not capable of adequately intermediating capital inflows or the inflows are perceived to be temporary.

The intensity of these policies has varied considerably across countries and over time (see Table 1). Central banks in Chile during the first half of 1990, Colombia in most of 1991, the Czech Republic during the latter half of 1994 and early 1995, Indonesia during 1991-1992, Malaysia from mid-1991 through early 1993, and Sri Lanka in 1991-1992 conducted open market operations on a scale so as to sterilize the capital inflows almost *fully*.1/ Other central banks, including Chile (mid-1991 to the present), Korea, Mexico, the Philippines, and Thailand sterilized *a portion* of the inflows they experienced. For example, when capital inflows peaked in 1993, Mexico sterilized about one-quarter of the inflows.2/

2. Reserve requirements

Reserve requirements can be manipulated to reduce the money multiplier and curtail the monetary expansion associated with the central bank intervention in the foreign exchange market (see Reinhart and Reinhart, 1997). Some countries have opted simply to increase the statutory reserve requirement on all domestic currency deposits. Leading examples of this are Costa Rica, the Czech Republic, Malaysia, and Sri Lanka. At the start of the inflow episode in 1989, Malaysia's statutory reserve requirement was 3-1/2 percent, but by early 1994 raised to 11-1/2 percent (Table 2). Other countries (Colombia 1991) imposed high *marginal* reserve requirements. In several countries where banks receive foreign currency deposits (Chile, Peru and Sri Lanka), reserve requirements on these accounts were either imposed for the first time or hiked. While this latter measure does not affect the narrow-money multiplier, it does reduce expansion in the broader aggregates relative to domestic reserves.

Not all countries, however, fit this mold. In some, financial sector reform and liberalization had the effects of reducing reserve requirements during or shortly before the large influx of capital. For example, in April 1989 Mexico replaced reserve requirements with a 30 percent liquidity ratio that could be satisified by holding interest-bearing government paper.3/ Argentina also reduced reserve requirements during the inflow period. In the Philippines, the Bangko Central reduced reserve requirements in August 1994 with the express objective of inducing a decline in domestic

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1/ In the cases of Indonesia and Malaysia other forms of sterilization, beside open market operations, were also being used during those periods. These will be subsequently discussed.

2/ Banco de Mexico (1993).

3/ See Coorey (1992).

interest rates and a narrowing of the domestic-to-international interest rate spread to reduce capital inflows (see Alfiler, 1994). In this case, the reduction in reserve requirements was not offset by changes in reserves so that the domestic money stock rose.

Reserve requirements are a tax on the banking system that will be passed in whole or in part to customers--either or both depositors or borrowers.1/ If it is the former, an increase in the reseserve tax lowers domestic deposit rates and acts a disincentive to capital inflows. If it increases lending rates, in contrast, it may induce firms to borrow abroad, stimulating further inflows. Applying Dornbush's overshooting model, Reinhart and Reinhart (1997) consider the impact on economic activitiy and relative prices of a rise in reserve requirements paired with an increase in domestic reserves that keeps the domestic money stock fixed. If borrowers have limited access to international capital markets (as is the case in most of these countries) raising reserve requirements tends to depreciate the real exchange rate and improve the current account.

In the majority of cases studied by Reinhart and Reinhart (1997), both deposit and lending rates adjusted. Hence, as with open market operations, the impact on capital flows of reserve requirement policy need not be what was intended. Further, if disintermediation occurs, and transactions increasingly take place in other financial institutions that are not subject to the requirements, a reserve requirement increase may have the unappealing feature of shifting activities toward entities for which it is more difficult to supervise and regulate.2/

3. Management of government deposits and of the funds

Indonesia, Malaysia, Taiwan Province of China, and Thailand have, at various times, shifted deposits of the public sector or pension funds from the banking system to the central bank (Table 3).3/ In the case of Mexico, the government also placed the proceeds of its privatizations in the central bank during 1991.

If these funds are counted as part of the money stock, then the transfer to the central bank works to increase reserve requirements (in that the reserve requirement on those deposits is increased to 100 percent). If the deposits are not counted as part of the money stock, then the shift is more akin to a liquidity-draining open market operation--with the difference that the central bank may not have to pay a market rate of interest on its deposits as it would on its sterilization bonds.

1/ This assumes, as is the case almost worldwide, that reserves that commercial banks hold at the central banks do not earn interest.

2/ See Calvo, Leiderman, and Reinhart (1994) and Folkerts-Landau et. al (1994).

3/ See Reisen (1993) and Folkerts-Landau (1994).

In the event, this mode of sterilization does not constitute a tax on the banking system, nor does it appear to increase short-term interest rates as much as sales of sterilization bonds. If the deposits are not remunerated, there is no quasi-fiscal cost; if they are remunerated at below-market interest rates, there is a quasi-fiscal cost, but it is below the cost of open market operations.1/ However, these deposit withdrawals, if volatile and unpredictable could complicate banks' cash management. Moreover, to the extent that some of the funds are not public sector deposits but rather insurance funds--along the lines of Malaysia's Employee Provident Fund (EPF) or Singapore's Central Provident Fund (CPF)--the cost is paid by those who contribute to the fund--it is a form of financial repression. Lastly, such policies may be limited in scope by the availability of the eligible funds. For instance, government deposits held at the Bank of Thailand increased from 25 percent of total government deposits at the end of 1987 to 82 percent in mid-1992.

4. Effects on interest rates, spreads and capital flows

Several distinct episodes of intensive sterilization offer an opportunity to gauge the macroeconomic effects of these policies. The main episodes examined include Chile during the first half of 1990, Colombia in most of 1991, Indonesia during 1991-92, and Malaysia from mid-1991 through early 1993. Six empirical regularities characterize these episodes.

First, in all cases, considerable international reserves accumulated, suggesting that the central bank had intervented to avoid or mitigate an exchange rate appreciation (Chart 1).

Second, in all cases, despite heavy foreign-exchange intervention by the central banks, either the rate of devaluation slowed or there was a revaluation (Malaysia). These two observations jointly attest to the large magnitudes of the inflows (Chart 2).

Third, reflecting the heavy open market operations, issuance of central bank notes increased dramatically (in both absolute terms and relative to the monetary base) and in a relatively short period of time. In the case of Colombia, the ratio of open market paper to the monetary base rose from less than 30 percent in late 1990 to over 80 percent by October 1991. In Chile, that ratio gained more than 100 percentage points in a period of six months. In Indonesia, there was a similar surge in outstanding Bank Indonesia Certificates (Chart 3). In Malaysia, where the central bank was selling Treasury bills and Bank Negara Bills (BNB), as well as borrowing heavily in the interbank market, a more comprehensive indicator of the sterilization effort is required. Chart 3 presents such

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1/ Quasi-fiscal costs are reduced or eliminated by transferring these costs to the government (i.e. by making them explicit fiscal costs).

a broad measure of central bank liquidity operations. In 1990, during the first year of heavy inflows, Bank Negara increased liquidity by US $6-1/2 billion; by 1993 the last year of the heavy sterilization effort (capital controls were imposed at the beginning of 1994), Bank Negara was draining liquidity at a rate of US $40 billion a year.

Fourth, in all four episodes, domestic short-term interest rose when sterilization began. Short-term rates increased in Korea (1988-89), Sri Lanka (1992-93), and the Philippines (1992-93:HI).1/ On the surface, this rise in domestic rates may appear inexplicable, in that the inflows of capital witness to greater demand for domestic assets. Moreover, in several of these countries (including Chile and Colombia), country risk premia declined, which should also have put downward pressure on domestic interest rates.2/ Table 4 summarizes the evolution of interest rates before, during, and after the sterilization period. The evidence in this tables shows that the rise in interest rates was often quite pronounced and, given the reduced rate of devaluation (or in the case of Malaysia an appreciation), the rise in ex post dollar interest rates was even greater.

This pattern may support Frankel's (1994b) contention that imperfect asset substituability plays a role. If increased investor demand falls on corporate bonds and equities, and they are poor substitutes for the short-term paper (or short-term treasuries) being supplied in increasing quantities by the central bank, domestic short-term rates would rise. In addition, given that capital inflows usually coincided with a period of stronger economic activity (and, in some instances, declining inflation), it is not implausible to suppose that money demand increased. In that circumstance, monetary policy was inadvertently tight--in that the central bank was not accommodating an increase in money demand. In any case, interest rates fell when sterilization policies were abandoned.

Fifth, and following from the previous observation, ex-post interest rate spreads (in dollars) were kept high by the sterilization policies, suggesting that policy has an impact, at least in the short-run, in determining how quickly domestic interest rates converge to international levels.3/ In all these cases, domestic short-term interest rates spreads remained relatively high to those of, say, Argentina, which did not undertake any form of sterilization. However, the monetary authorities

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1/ See Hettiarachchi and Herat (1994) for Sri Lanka and Alfilier (1994) for the Philippines. The Colombian experience is detailed in Rodriguz (1991). For a comprehensive study of the Indonesian case see Harinowo and Belchere (1994) while for Malaysian experience see Aziz (1994).

2/ An indication of the evolution of country risk is given by the behavior of secondary market prices for loans, which were increasing sharply during these episodes (see Calvo, Leiderman, and Reinhart, 1993).

3/ Frankel (1994b), for instance, has suggested that expected devaluation can fully account for observed interest differentials. However, his result would not be inconsistent with a steady-state offset coefficient of unity.

ability to affect domestic interest rates and effectively control the money supply appears to have eroded over time.1/ Indeed, this conclusion runs through many case studies (see Alfilier, 1994; Aziz, 1994; Harinowo and Belchere, 1994; Hettiarachchi and Herat, 1994; and Rodriguez, 1991). In all four cases considered, sterilization policies were either abandoned altogether, scaled back, or complemented by capital controls, as it became evident that the high domestic interest rates were attracting more inflows.

Sixth, in addition to attracting further short-term flows, the rise in short-term interest rates (and interest rate differentials) associated with sterilized intervention dampened investment demand when sustained for a sufficient period. That is, as a result of the intervention--holding all else equal--the cost of capital rose with the returns on less risky assets (such as government paper). As a consequence, investment in financial assets increased relative to investment in plant and equipment. Thus, sterilized intervention could have encouraged a shift in the composition of capital inflows away from long-term to short-term flows. In all of these countries, short-term flows as a share of total capital inflows rose at least initially in response to sterilization of intervention.2/ There does not appear, however, to have been any pronounced or sustained shift in the composition of capital inflows as a result of such intervention, owing possibly to the briefness of the episodes or mitigating factors (principally those influencing foreign direct investment behavior).

III. EXCHANGE RATE POLICY

As a general rule, rising capital inflows have tended to induce an appreciation of the nominal exchange rate. In the short-run, monetary authorities have often opted to limit or to avoid the nominal appreciation, but, as the inflows persisted and reserves accumulated, these policies became more costly. As a result, several countries allowed their currencies to respond more to market forces by either revaluing, increasing exchange rate flexibility, or, as in the cases of Chile and Colombia, allowing both. The remainder of this section discusses the relative merits of greater exchange rate flexibility and reviews the experiences with these policies for several capital-importing countries.

1. Revaluation

1/ This is consistent with Schadler's et. al (1993) findings.

2/ A more detailed description of changes in the composition of capital flows is provided in Montiel and Reinhart (1997).

In a floating-exchange-rate regime, an appreciation of the nominal exchange rate in response to an increased demand for domestic assets need not prompt policy action because the exchange rate is free to appreciate. However, if the prevailing arrangement involves an official commitment to a peg, crawling peg, or narrow band, then, at some point, a decision to realign may be necessary. There are several advantages of allowing the nominal exchange rate to appreciate during periods of heavy capital inflows (see Calvo, Leiderman, and Reinhart, 1994). First, it insulates the money supply, domestic credit, and the banking system from the inflows, which is particularly desirable if the inflows are perceived to be highly reversible. If banking supervision is poor and there are inefficiencies in pricing risk, there may be additional reasons to limit banks' role in intermediating the capital inflows. Second, if economic fundamentals warrant a real exchange rate appreciation, the adjustment comes via the exchange rate and not via higher inflation. Third, and related to the previous point, because of the pass-through from the exchange rate to domestic prices, an appreciation may help reduce inflation.

Despite the advantages of allowing the exchange rate to adjust to changing market conditions, revaluations have been a relatively uncommon response to surging capital inflows (hence the prevalence of sterilized intervention policies). In Chile and Colombia, the realignment was sought only after it became evident that the inflows and the exchange rate pressures were more persistent than initially believed. Between April 1991 and June 1991, Chile's band was revalued by a cumulative 3.4 percent (Table 5). Larger revaluations followed in January 1992 (5 percent) and November 1994 (9.5 percent), as the exchange rate became persistently stuck on the floor of the band.1/ A similar pattern emerged in Colombia, where a crawling peg system had been in place for about 25 years (see Carrasquilla, 1995). Still within the context of a peg, the exchange rate was revalued by 2.6 percent in June 1991. More substantial realignments occurred much later in 1994 (5 percent and 7 percent in January and November respectively), in the context of the newly established exchange rate band.

2. Greater exchange rate flexibility

Allowing the exchange rate to *fluctuate* more freely in the presence of large capital inflows introduces uncertainty that may well discourage some of the purely speculative (and highly reversible) inflows. Bacchetta and van Wincoop (1994) argue, in the context of a two-country model, that an increase in exchange rate uncertainty creates a bias toward the domestic asset (because the rate of return on the foreign asset is made more uncertain), dampens the sensitivity of the current account

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1/ See Budnevich and Cifuentes (1993).

to most types of shocks, and reduces net capital flows. Indeed, the higher uncertainty acts like a Tobin tax. In the event of capital outflows, the greater flexibility take some of the pressure off foreign exchange reserves. In addition, it grants the monetary authorities a greater degree of independence and permits them to exercise more control over the monetary aggregates.

The main disadvantage of a pure float is that massive capital flows may induce steep and *abrupt* movements in the real exchange rate, which, in turn, may impose a substantial adjustment burden on the economy. In particular, the concern in many countries has been that real appreciation will harm strategic sectors of the economy, such as the nontraditional export sector. If the inflows are temporary and if there are hysteresis effects--or permanent damage--to exports from the real exchange rate appreciation, there may be reasons for avoiding or dampening the real exchange rate adjustment (see Krugman, 1987).1/ Some empirical evidence (see, for instance, Grobar, 1993) suggests that greater real exchange rate volatility may have negative effects on tradable-goods sectors. This result may be due to the existence of incomplete markets, to the extent that financial markets do not provide enough instruments to hedge against such uncertainty.

There is a wide degree of cross-country variation in the degree of exchange rate flexibility among the capital importing countries. While some countries, such as Peru and the Philippines have a float, the common ground appears to be that all central banks intervene in the foreign exchange market to some degree. Among the Asian countries, Indonesia widened its intervention band twice (Table 6) and Malaysia and the Philippines have allowed greater variability in the exchange rate, particularly since 1992 (see Table 7). Among the Latin American countries, Chile, Mexico and more recently Colombia have allowed some degree of exchange rate flexibility in the context of their exchange rate bands. Both Chile and Mexico widened their bands (Table 6 provides details), and especially in Chile the exchange rate has been allowed to extensively fluctuate within the band.2/

However, as Table 7 highlights, despite announcements of wider bands, the variance of monthly exchange rates in some of these countries has shown little change. The variance of monthly exchange rates in Indonesia, for example, did not change after the band was widened twice in 1994. Similarly, during 1992 and 1993 and most of 1994 the variance of the Mexican peso remained about the same as it was when the exchange rate was fixed (i.e. nil) and about the same as Argentina's

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1/ Hysteresis effects may arise due to, say, a permanent (or very persistent) loss of market share for a country's exports.

2/ On various aspects of exchange rate bands in Chile and Mexico, see Helpman, Leiderman, and Bufman (1993).

exchange rate under the Convertibility plan. By contrast, there was a marked jump in the variance of the exchange rate in Colombia after the introduction of the band in January 1994 and a more moderate, but nonetheless noticeable increase in exchange rate variance in the case of Malaysia.

To date, the historical record is inconclusive as to ho much sand is thrown into the gears of international finace by exchange rate variability. But this follows because there is too much, not too little, variation in the sample. In the case of Chile, where short-term flows as a proportion of total flows have declined, there were other impediments to short-term inflows (i.e. capital controls).1/ In the case of Colombia, where the composition of flows show a similar pattern to Chile's, the introduction of the band coincides with the imposition of a tax on short-term borrowing making it difficult to isolate the effects of individual policies. For Malaysia, the effects of increased exchange rate variability may have been offset by tight money policies which kept short-term domestic interest rates above world levels.

IV. FISCAL POLICIES

Another policy reaction to capital inflows has been to tighten fiscal policy either by reducing expenditures, increasing taxes, or both (Table 8). The logic run that fiscal restraint can lower aggregate demand. However, the devil is in the details of how the fiscal gap is closed. For instance, if government expenditure is more heavily weighted toward the nontraded good than is private expenditure, then a cut in government spending may be more effective in alleviating pressures on the real exchange rate than heavier taxation of the private sector. The scales tip further away from using tax policy if consumer credit is readily available, as it usually is during periods of heavy capital inflows. In that circumstance, the greater availability of financing may compensate for the reduction in disposable income owing to the increase in taxes, a tendency that would be particularly pronounced if the tax is perceived as temporary. However, a contraction of government expenditure is always a sensitive political issue that cannot be undertaken on short notice. Such delays increase the risk that, ex-post, the policy is procyclical. Further, fiscal policy is usually set on the basis of medium or long-term considerations, such as infrastructure and social spending needs, rather than in response to potentially short-term fluctuations in international capital movements (Bercuson and Koenig, 1993).

The clearest example of the use of fiscal restraint as a key policy response to capital inflows is Thailand, particularly during 1988 to 1991 (see also Schadler et. al, 1993; and Nijathaworn and

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1/ See Reinhart and Smith (1997).

Dejthamrong, 1994). Moderation of government expenditure and a strong cyclical improvement in revenues swung the government budgetary balance from a deficit of 1.4 percent of nominal GDP to a surplus of 4.9 percent in 1991.1/ Thailand also provides an example of the conflict between near-term expediency and longer-run ambitions. In the years that followed, the booming growth of the economy generated a need to improve the country's infrastructure, but the pressures on the real exchange rate that accompanied the surge in inflows warranted fiscal restraint. Such infrastructure bottlenecks were not exclusive to Thailand: Malaysia, which averaged above an 8 percent annual growth rate for seven consecutive years, faced similar constraints. By substantially limiting public consumption, Malaysia began to downsize its public sector during 1992. In that year the overall public sector deficit shrank by about one percent of GDP to around 1.5 percent of GDP. Since mid-1990, Chile has also sought fiscal restraint through an increase in the value added and corporate taxes and by moderating expenditure.

Most other capital-importing countries fiscal policy have not resorted to fiscal restraint to respond to rising capital inflows. Indeed, many of the fiscal austerity measures that were undertaken in the early 1990s were part of domestic inflation stabilization plans, privatization efforts, or adjustments associated with Fund programs that were begun at that time or already underway. Example of such consolidation efforts include Argentina, Mexico, and Sri Lanka. Hence, because of lags and difficulties in initiating a policy change and because of its medium-term focus, fiscal policy is not a particularly effective means of dealing with capital inflows, particularly if these are temporary and subject to abrupt changes. There are also important asymmetries in using fiscal policy to deal with fluctuations in international capital inflows. In particular, while a fiscal tightening has sometimes been suggested as a means of dealing with inflows, a loosening of fiscal policy would not likely stem outflows.

V. CAPITAL ACCOUNT MEASURES

Perhaps frustrated by the indirect and unpredictable means by which traditional stabilization tools influence capital inflows, several countries have adopted direct policies to alter their volume or composition. These policies naturally fall into two groups: those that discourage inflows and those that encourage outflows.

1/ Public consumption as a share of GDP, which averaged 13.6 percent during 1984-88 declines to 9.9 percent during 1989-93--the early years of the surge in capital inflows (see Calvo, Leiderman, and Reinhart, 1994).

1. Taxing short-term flows and prudential regulation

Government intervention takes its starkest form in the taxation of gross inflows, often as a tax that falls more heavily on short-term inflows. The father of such policy advice, of course, is James Tobin, who has for many years advocated imposing a transactions tax to shift investors' focus to longer-term and, presumable, more stable outlets for their funds. The theory and practice of a Tobin tax have been explored in Haq, Kaul, and Grunberg (1996) and Reinhart (1997). This is one area, though, where practioners have probably moved more rapidly than theoreticians, in that the policies adopted by Chile in 1991 and Colombia in 1993 and, more recently, in Thailand in 1996 fall could be described as Tobin taxes. In these cases, a nonremunerated reserve requirements must be deposited at the central bank on liabilities in foreign currency from direct borrowing by firms. In the case of Colombia, the reserve requirement must be maintained for the duration of the loan and applies to all loans with a maturity of five years or less, except for trade credit with a maturity of four months or less. The percentage of the requirement declines as the maturity lengthens; from 140 percent for funds that are 30 days or less to 42.8 percent for five year funds. For Chile, the tax is of the form of a nonremunerated 30 percent reserve requirement to be deposited at the central bank for a period of one year on liabilities in foreign currency from direct borrowing by firms. In principle, because of their breadth, these measures affect the household sector, nonfinancial business, and the banking system's ability to borrow offshore.

Brazil has implemented a variety of taxes on inflows, with greater variation across assets as well as across maturities. As in the case of Chile and Colombia, the tax on foreign issuance bonds falls on the borrower. However, some other taxes are paid by foreign lenders. Notably, foreigners investing in the stock market have to pay a one percent tax up front.1/ Hence, the tax falls more heavily on active investors that trade more often and hold stock for only relatively short periods of time. The tax to be paid by foreigners on fixed-income investments has similar characteristics.

The main disadvantage with these measures is that flows are likely to be re-routed through other channels. For example, through over/under-invoicing of imports and exports since trade credits are exempt from the tax (see Mathieson and Suarez, 1993). Other have argued that, in the case of Chile, over-invoicing of imports is not likely to be an attractive alternative since imports are

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1/ This was eliminated on March 10, 1995, in order to encourage inflows on the wake of the Mexican crisis.

taxed at a comparable rate (see Laban and Larrain, 1993).1/ Indeed, inflows to Chile in 1991 were below those observed in 1990, possibly attesting to the success of this policy. While net inflows increased, once again in 1992 and beyond, the increases came primarily in foreign direct investment and other long term flows. A similar pattern emerges in Colombia during 1994, with short-term flows accounting for a declining share of total flows; However, *total* inflows to Colombia continued to increase in 1994.

In other instances, capital controls have been quantitative in nature. Measures implemented have included prudential limits, or prohibition, on non-trade related swap activities, offshore borrowing, and banks' net open market foreign exchange positions (Indonesia, Malaysia, Philippines, Thailand), caps on banks' foreign currency liabilities (Mexico), or more blanket measures that prohibited domestic residents from selling short-term money-market instruments to foreigners (Malaysia).

In the case of Malaysia, a combination of sizable domestic/foreign interest rate differentials and widespread expectation of an appreciation of the ringgit during the late 1993 led to a surge in short-term capital inflows that culminated with the imposition of measures to restrict inflows in January 1994. The inflows came in the form of a marked rise in short-term bank deposits and were seen as speculative in nature. Consequently, most of the measures were directed toward the control of the activities of the financial sector and most were announced to be temporary (see Aziz, 1994; and Reinhart and Smith, 1996). It appears that the most successful of these measures in reducing short-term inflows was that which prohibited domestic residents from selling short-term money-market instruments to foreigners; as the certificates of deposits (CDs) matured and could not be rolled over, short-term inflows (and the monetary aggregates began to shrink. However, as with taxation of inflows, if such policies are maintained indefinitely they will likely reduce the competitiveness and retard the development of the financial sector.2/

In April 1992, Mexico passed a regulation that limited foreign currency liabilities of commercial banks to 10 percent of their total loan portfolio. However, it is not clear to what extent this measure acted to reduce the size of the capital inflows, as banks' total loan portfolios had been expanding rapidly throughout that period and the initial share of loans in foreign currency was well below the 10 percent limit. For example, bank assets grew 41 percent in 1992 while foreign currency loans

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1/ However, some circumvention of the tax is effected by reclassifying loans as trade-related.

2/ Malaysia removed most capital controls during the second half of 1994.

grew 88 percent; a similar pattern emerged in 1993, with foreign currency loans increasing 50 percent while total loans rose 25 percent. Indeed, the constraint only appears to have become binding in 1994 when total and foreign currency loans both rose by 27 percent.

Based on the recent experiences of these selected countries with policies directed toward curbing short-term capital inflow, two observations stand out. First, the Chilean and Malaysian experience attests that, at least in the short-run, these two distinctly different policies were successful in reducing the *volume* of inflows in a relatively brief period of time. Hence, if the inflows are largely seen as a temporary phenomenon, such policies could be effective; the longer the inflows persist or the longer the policies remain in place, however, the greater the chances that the controls become less binding. Second, it could be argued that, as desired, these policies stretched out the maturity of capital inflows (as was also the case in Colombia).

2. Liberalizing capital inflows

A different approach to tempering the impact of large gross capital inflows has been to remove controls on capital outflows, thereby increasing outflows and lowering net inflows. These policies have usually allowed domestic investors (notably, pension funds) to acquire foreign assets. Chile, Colombia, Malaysia, Mexico, Philippines, Sri Lanka, and Thailand are among those that have liberalized capital outflows (see Table 9). This approach assumes that the existing controls on outflows were binding, a proposition that has been questioned by several studies (see Dooley, 1995 for a review of this literature). It also assumes that gross inflows will *not* be affected in a *positive* manner by the liberalization announcement, which is potentially problematic. On both theoretical grounds and based on the evidence from many country cases, it appears that liberalization of outflows has actually induced heavier inflows (see Bartolini and Drazen, 1994; and Laban and Larrain, 1994). Examples include: Italy and New Zealand in 1984, Spain in 1986, Yugoslavia in 1990 and Chile in 1990s. Lifting restrictions on capital outflows sends a positive signal, increasing the confidence of the foreign investors and further stimulating capital inflows.

Lastly, a policy of liberalizing capital outflows presumes that a greater ability by domestic residents to invest abroad will translate into greater investment abroad. In that regard, the effectiveness in inducing outflows may be undermined if domestic interest rates are kept high relative to international levels (say by sterilization policies) because domestic residents would lack sufficiecnt inducement to shift into foreign assets (even though it is now permissible). Certainly, stock market returns in dollars during 1990 to 1993 for several of the countries that liberalized (including Chile,

Colombia, Malaysia, Mexico, and Thailand) far exceeded the returns available in major industrial countries.

3. Banking regulation and supervision

A major concern about the intermediation of international capital flows through the domestic banking system is that individual banks are subject to free or subsidized deposit insurance; ie., there is an implicit commitment by the authorities that banks--especially those of large size--will not be allowed to fail. Made complacent by the assurance of such a safety net, banks may take on more risk in the search for higher return and pay little attention to the matching of the maturities of deposits against those for loans--the formally being typically shorter than the latter. Similarly, there could be a mismatch between the currency denomination of bank loans and the currency denomination of profits and incomes of the borrowing sector; e.g., consider the producer of a nontradable commodity borrowing in U.S. dollars to finance his activity. All these factors increase the vulnerability of the financial system to reversals in capital flows--reversals that have the potential to end in financial crises.

It is the role of bank regulation and supervision to diminish these risks. As discussed earlier, attempting to insulate the banking system from short-term capital flows is a particularly important goal in cases where a substantial portion of the inflows are in the form of short-term bank deposits. Regulation that limits the exposure of banks to the volatility in equity and real estate markets could help insulate the banking system from the potential bubbles associated with sizable capital inflows. In this vein, risk-based capital requirements, in conjunction with adequate banking supervision to insure such requirements are complied with, could help insulate the domestic banking system from the vagaries of capital flows.

VI. POLICY: SOME LESSONS

One theme has run through the country experience discussed in this paper: Individual policies interact either to produce unintended effects on the composition of capital inflows or to undercut their individual effectiveness.

The Mexican experience from 1990 to 1993 provides an example of the former (Table 9). A combination of little or no short-term exchange rate uncertainty (as is the case when there is an implicit or explicit peg), sterilized intervention (which tends to prevent domestic short-term interest rates from converging toward international levels), and no binding impediments to capital inflows (through either taxation or quantitative constraints) likely maximizes the volume of short-term capital

inflows a country receives. This follows because the pairing of little or no short-term exchange rate risk and relatively high domestic interest rates favors the short-term investor; for the long-term investor there is always exchange rate risk since over longer horizons the probability of a realignment of the peg or a change in the exchange rate regime increases. Further, long-term investments (such as foreign direct investment) tend to be less interest sensitive.

In contrast, the mix of sterilized intervention and controls on inflows may undermine the individual effectiveness of these policies. The comparatively high interest rate differentials that usually accompany sterilization may act as an inducement to circumvent the capital controls (i.e., firms and banks may find ways of borrowing offshore). To the extent that they are successful in dodging the controls, this tends to offset some of the contractionary effects of the sterilization efforts. Along the same lines, liberalizing controls on outflows as a policy aimed at reducing net capital inflows may backfire if domestic interest rates are high relative to international levels or if it is interpreted a positive signal of the future economic environment. Indeed, several countries (Chile, Malaysia, and Thailand, see Table 10) liberalized outflows while at the same time engaging in substantive sterilization efforts.

It is now 1997, about eight years after the initial surge in capital inflows. We have witnessed the abrupt reversal of flows in Mexico and Argentina in 1994 and 1995, the Czech Republic and East Asia in 1997 and the apparently far-reaching contagion associated with those episodes. This sorry record should remind policy makers that capital inflows are not always a reward for good behavior. All too often, capital inflows fed the mistaken beleif that rapid economic growth and booming asset prices would be a permanent feature of a new era. Policy makers who fell into that trap were more likely to not be sufficiently guarded in their fiscal spending--relying on the rapid revenue growth of the boom years-- and leave the regulation and supervision of the banking sector grossly unattended. If the boom during the inflow years is overly exuberant--so too can be the punishment when investors retrench.

It may be the case that even the best policy mix cannot avoid altogether the eventual reversal of capital flows. However, the appropriate policy mix may dampen the amplitude of the swings in capital flows, thus delivering a softer landing in those episodes when international investors pull back. In this regard, strongest policy lesson that emerges from these episodes is the need for conservative fiscal policies and a zealous supervision of the domestic financial sector at all times and a strengthening of that commitment during the boom phase of the cycle, when expectations are

buoyant. Unfortunately, in most cases, policymakers only focussed their attention on the financial sector when problems started to emerge. As to monetary and exchange rate policy, greater exchange rate flexibility may stem the cycle of foreign exchange intervention and sterilization, which appears to act as a magnet for capital flows and leave countries with "too much of a good thing."

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Table 1b. Sterilization through Open Market Operations: Eastern Europe and Latin America

Chile (1990)

January 5, 1990:
Large scale sterilization efforts begin with the Central Bank increasing its long-term real interest rate on its bonds from 6.9 percent to 9.7 percent and its 90-day paper from 6.8 to 8.7 percent.

August 17, 1990:
Short-term rates begin a moderate decline (from 8.7 to 8.2 percent).

March 18, 1991:
Further easing of policy with 90-day paper reaching 5.7 percent and 360-day paper declining from 9.2 to 5.9.

April 2, 1992:
Further easing with bond rate reduced from 9.7 percent to 6.6 percent.

August 20, 1992:
Policy begins to tighten with short-term rate rising to 5.7 percent.

November 2, 1992:
Further tightening with short-term rate rising to 6.5 percent and long-term rate rising to 7.7 percent.

September, 1993:
Yield curve becomes inverted with 10-year bond rate at 6.4 percent and short rates remaining at 6.5 percent.

November 2, 1992:
Further tightening

Colombia (1991)

January, 1991:
Heavy sterilization of inflows begins.

October, 1991:
Sterilization policies are abandoned.

Czech Republic (1992)

August, 1994-March, 1995:
Sterilization policies are conducted through heavy sales of government securities and central bank paper.

Mexico (1990)

1990-1993:
Partial sterilization of inflows through sales of government paper, mostly domestic currency-denominated CETES.

Sources: Aziz (1994), Banco Central de Chile Memoria Anual, various issues, Banco Central de Chile, Evolucion de la Economia, various issues, Bank Negara Annual Report, various issues, Harinowo and Belchere (1994), Kang (1994), Laporan Mingguan Weekly Report, various issues.
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 1a. Sterilization through Open Market Operations: Africa and Asia

Egypt (1991)

February, 1991-1994:
Sterilization was done through open market sales of treasury bills.

Indonesia (1990)

February, 1991:
Significant monetary tightening. Sales of SBIs increase sharply.
March, 1991:
State enterprises were instructed to convert Rp 10 trillion in bank deposits to Bank Indonesia certificates (SBIs).
May, 1993:
Monetary policy begins to ease and sterilization efforts diminish.

Kenya (1993)

October, 1993-March, 1994:
Large-scale sterilization through increased sales by the Central Bank of Kenya of treasury bills.

Korea (1992)

April, 1993:
Korea begins to sterilize through auctions of monetary stabilization bonds (MSB). Previously open market operations consisted of a mandatory allocation scheme whereby the Bank of Korea allocated securities at controlled, below-market interest rates.

Malaysia (1989)

1990:
Central Bank begins to borrow in interbank market.
1992:
Heavy open market operations begin as the Central Bank steps up sales of Treasury bills and borrows heavily in the interbank market.
February 10, 1993:
Bank Negara begins to issue Bank Negara Bills (BNB), which are similar to Malaysian Government Treasury bills. This move was prompted by the need to have an instrument thorough which to conduct open market operations, since Treasuries issuance was dwindling in line with the shrinking government deficit. During the first half of 1993 issuance is RM 9,300 billion during the second half issuance tapers off to RM 4,300 billion.
February 16, 1993:
The central bank sells the first issues of the Malaysia Savings Bond MSB) RM 1 billion.

Philippines (1992)

1992:
Sterilization efforts intensify through issuance of Central Bank bills and borrowings under the Central Bank reverse repurchase facility. Further, in view of the Central Bank's lack of holding of Treasury bills, the government was called to issue government securities and deposit the proceeds with the Central Bank.
mid-1993:
Sterilization efforts diminish and the government shifts its deposits out of the Central Bank to commercial banks. More adjustment comes through allowing the nominal exchange rate to appreciate.

Sources: Alfiler (1994), Asea and Reinhart (1995), Aziz (1994), Banco de Mexico, Informe Anual 1993, Bank Negara Annual Report, various issues, Hettiarachi and Herat (1994), Nijathaworn and Dejthamrong (1994).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 1a. Sterilization through Open Market Operations: Africa and Asia

Sri Lanka (1991)

1991-92:

Intense sterilization efforts through open market operations of Treasury bills.

mid-1993:

After depleting its holdings of Treasury bills, the Central Bank begins to issue paper in order to conduct open market operations. Sterilization efforts moderate.

Thailand (1988)

1989-91:

Heavy sterilization period. During this period the Bank of Thailand increases its rediscount rate from 8 percent at the end of 1989 to 12 percent at the end of 1990.

late 1989:

The Central Bank reduces commercial banks access to refinancing facilities. The amount of refinancing was reduced from 100 percent to 50 percent of the face value of qualifying notes.

Mid-1993:

Sterilization efforts cease.

Uganda (1993)

1993-April, 1994:

Sterilization took place through central bank sales of treasury bill. Due to insufficient new issues and the lack of a well-developed secondary market, it became increasingly difficult for the central bank to pursue sterilization policies for an extended period of time.

Sources: Alfiler (1994), Asea and Reinhart (1995), Aziz (1994), Banco de Mexico, Informe Anual 1993, Bank Negara Annual Report, various issues, Hettiarachi and Herat (1994), Nijathaworn and Dejthamrong (1994).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 2b. Changes in Reserve Requirements: Eastern Europe and Latin America

Argentina (1991)

August 15, 1993:

Reserve requirements on domestic and foreign currency demand deposits were raised from 40 to 43 percent. A 3 percent reserve requirement on domestic and foreign currency 30-89 day time deposits was introduced.

Brazil (1992)

July 1, 1994:

A 100 percent marginal reserve requirement on demand deposits and a 20 percent reserve requirement on time deposits is introduced. Reserve requirements on saving deposits are raised from 10-15 percent to 20 percent.

August 31, 1994:

Reserve requirement on time and saving deposits are raised to 30 percent.

December 6, 1994:

A 15 percent reserve requirement on loans for the purchases of goods is introduced.

April 28, 1995:

Reserve requirement on time deposits is raised back from 27 percent to 30 percent. The marginal reserve requirement on certificates of deposit is raised to 60 percent. The reserve requirement on loans is raised from 6 percent to 18 percent.

Chile (1990)

January, 1992:

Nonremunerated 20 percent reserve requirement on deposits and loans in foreign currency held by commercial banks. The reserve requirement must be maintained for one year.

May, 1992:

Reserve requirement on foreign currency deposits and loans held by commercial banks is increased to 30 percent. The requirement was designed to make the tax rate fall as the maturity increases. A 30 percent marginal reserve requirement is on interbank deposits is introduced.

Colombia (1991)

January, 1991:

Marginal reserve requirements of 100 percent were imposed on all new deposits. These reserves were held as interest-bearing central bank bonds.

September, 1991:

The marginal reserve requirement was replaced by an increase in reserve requirements on most deposits.

Costa Rica (1991)

October 1992:

Reserve requirement on domestic currency demand deposits is raised from 30 to 34 percent, and those on time deposits from 10 to 14 percent.

Czech Republic (1992)

August, 1994:

Reserve requirements were raised from 9 percent to 12 percent.

Mexico (1990)

April, 1992:

A compulsory liquidity coefficient for dollar liabilities was set at 15 percent. This coefficient must be invested in liquid securities denominated in the same currency.

Sources: Aziz (1994), Banco Central de Chile Memoria Anual, various issues, Banco Central de Chile, Evolucion de la Economia, various issues, Bank Negara Annual Report, various issues, Gurria (1993), and Hettiarachi and Herat (1994),and Rodriguez (1991).

Note: The date next to the country name denotes the first year of the surge in inflows.

Table 2a. Changes in Reserve Requirements: Africa and Asia

Kenya (1992)

October 1993-March 1994:
Statutory cash ratio is increased in three steps from 12 percent to 20 percent.

Indonesia (1990)

December 14, 1995:
Commercial bank reserve requirement is raised from 2 percent to 3 percent.

Malaysia (1989)

May 2, 1989:
Reserve requirement is increased to 4.5 percent from 3.5 percent for commercial banks and 3.0 percent for finance companies.

October 16, 1989:
Reserve requirement is increased from 4.5 to 5.5 percent.

January 16, 1990:
Reserve requirement is increased from 5.5 to 6.5 percent.

August 16, 1991:
Reserve requirement is increased form 6.5 to 7.5 percent.

September 16, 1991:
All outstanding ringgit received through swap transactions with non-residents, including offshore banks, would be included in the eligible liabilities base and be subject to the statutory reserve requirements.

May 2, 1992:
Reserve requirement raised to from 7.5 to 8.5 percent.

January 3, 1994:
Reserve requirement increased from 8.5 to 9.5 percent. The reserve requirement is extended to cover foreign currency deposits and transactions (such as foreign currency borrowing from foreign banking institutions and interbank borrowing). Previously it had only applied to ringgit-denominated transactions.

1994:
Reserve requirement increased in two steps to 11.5 percent.

February 1, 1996:
Reserve requirement raised to 12.5 percent.

Philippines (1992)

August 15, 1994:
The reserve requirement is reduced from 20 percent to 17 percent with the objective of inducing a decline in domestic interest rates.

Sri Lanka (1991)

November 1, 1991:
Reserve requirement raised to 13 percent.

January 24, 1992:
Reserve requirement raised to 14 percent from 13 percent.

September 4, 1992:
Reserve requirement extended to include foreign currency deposits.

September 24, 1992:
Reserve requirement lowered back to 13 percent.

January 29, 1993:
Reserve requirement raised 0.5 to 13.5 percent.

April 16, 1993:
Reserve requirement raised to 14 percent.

May 21, 1993:
Reserve requirement raised to 15 percent.

Source: Hettiarachi and Herat (1994).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 3. Sterilization through Management of Government Funds

Czech Republic (1992)

December, 1994-February, 1995:

Commercial bank deposits of the National Property Fund, amounting to about Kc 16 billion (or 10 percent of reserve money) were transferred to the Czech National Bank.

May, 1995:

An additional Kc 6 billion was transferred.

Malaysia (1989)

April, 1990:

The Money Market Operations (MMO) Account on the accountant general maintained at the Central Bank was reactivated. Government deposits that were placed with the banking system maturing that year (about $3.7 billion) were withdrawn from the system and deposited in the MMO account.

1992-94:

Transfer of government and Employee Provident Fund (EPF) deposits to the central bank.

Philippines (1992)

The National Government issues securities and deposits proceeds with the Central Bank.

Singapore

Savings of Central Provident Fund (CPF) are heavily invested in government bonds.

Taiwan Province of China

Postal savings were transferred from the domestic banks to the central bank.

Thailand (1988)

1987-mid-1992:

Government deposits held at the Bank of Thailand increased from 25 percent of total deposits at the end of 1987 to 82 percent in mid-1992.

Sources: Aziz (1994), Bank Negara Annual Report, various issues, and Folkerts-Landau et. al. (1995).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 5. Revaluations of the Exchange Rate

Chile (1990)

April, 1991:
The band is revalued by 0.7 percent.
May, 1991:
The band is revalued by 0.7 percent.
June, 1991:
The band is revalued by 2 percent.
January 23, 1992:
The band is revalued by 5 percent.
November 30, 1994:
The band is revalued by 9.5 percent.

Colombia (1991)

June, 1991:
Nominal revaluation of 2.6 percent.
January, 1994:
The band is revalued by 5 percent.
December, 1994:
The band is revalued by 7 percent.

Sources: Banco Central de Chile Memoria Anual, various issues, Banco Central de Chile, Evolucion de la Economia, various issues, Carrasquilla (1995), and Schadler et. al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 6. Increasing Exchange Rate Flexibility

Chile (1990)

January, 1992:
The central parity is revalued by 5 percent and exchange rate band is widened from 10 percent to 20 percent, 10 percent on each side.

July, 1992:
The exchange rate ceases to be pegged exclusively to the dollar and a peg to a basket of currencies (50 percent dollar, 30 percent deutsche mark, and 20 percent yen) is introduced.

November 30, 1994:
The central parity is revalued by 9.5 percent. The weights of the currency basket are changed to 40 percent dollar, 35 percent deutsche mark, and 25 percent yen.

Colombia (1991)

January 25, 1994:
An exchange rate band is introduced. The width of the band is 15 percent and the rate at which the band is to be devalued is equal to 11 percent per annum.

Czech Republic (1992)

February 28, 1996:
An exchange rate band is introduced; the width of the band is 15 percent.

Indonesia (1990)

January, 1994:
Intervention band widened from 10 to 20 rupiah.

August, 1994:
Intervention band widened from 20 to 30 rupiah.

January 1, 1996:
Intervention band widened from 2 percent to 3 percent.

June 13, 1996:
Intervention band widened.

Malaysia (1989)

mid-1991:
Greater degree of flotation allowed.

Mexico (1990)

November 11, 1991:
An exchange rate band is introduced. The upper-limit of the band was depreciated at the rate of 20 cents a day and the floor remained fixed. Its total width increased from 1.2 percent in November 1991 to 4.3 percent in December 1992.

October, 1992:
The rate of crawl of the upper limit is increased to 40 cents per day.
The band width reached 8.7 percent by the end of 1993.

Philippines (1992)

Mid-1992:
Reduced foreign exchange intervention allowing for a nominal appreciation of the peso.

Thailand (1988)

January 17, 1997:
Central bank boar members approve doubling the width of the baht's fluctuation band against the dollar; the move was expected to later in the year.

Sources: Aziz (1994), Alfiler (1994), Carrasquilla (1995), Harinowo and Belchere (1994), Gurria (1993), Helpman, Leiderman and Bufman (1995), and Schadler et al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 8. Fiscal Austerity Measures

Chile (1990)

1990-1994:

Moderation of expenditure. Nonfinacial public sector surplus averages 2.5 percent during this period.

Mid-1990:

An increase in the value added tax rate to 18 percent. An increase in the corporate tax to 15 percent, and an increase in the progressiveness of the personal income tax.

Malaysia (1989)

1992-93:

Fiscal consolidation. Real public consumption growth reduced significantly (0.4 percent in 1992). Public sector deficit reduced to about 1.5 percent of GDP.

Thailand (1988)

1988-1991:

Moderation of government expenditure. Government budgetary balance (as a percent of GDP) swings from a deficit of 1.4 percent to a surplus of 4.9 percent in 1991.

1992:

Introduction of a value added tax.

Sources: Gonzalez (1995), Nijathaworn and Dejthamrong (1994), and Schadler et. al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 9b. Liberalization of Outflows: Latin America

Chile (1990)

April, 1990:

New regulations liberalizing foreign exchange market operations. Previously, all foreign exchange market operations prohibited unless under Central Bank's specific authorization. New, all transactions permitted unless specifically restricted by Central Bank.

1991:

In a number of steps (February, April, May, and October), commercial banks were permitted to increase external trade financing and use up to 25 percent of foreign exchange time deposits for foreign trade financing. Joint venture rules were simplified, and the waiting period for remitting capital invested in Chile under the debt conversion program was shortened. Procedures for enterprises to directly invest abroad were modified and made easier. (These types of transactions were already done through the legal informal market.)

March, 1992:

a) Pension funds allowed to hold a portion of their portfolio in foreign assets (government bonds, certificates of deposit, and bankers' acceptances). Limit on these investments increased gradually to 10 percent of investment portfolio.

b) Limit on net foreign exchange holdings of commercial banks was doubled. Share of export receipts exempt from surrender requirements increased. Allocations of foreign exchange for a variety of payments abroad (including travel) raised. Period for advance purchase of foreign exchange for debt service extended.

Colombia (1990)

June, 1990:

Ceiling applicable to foreign currency deposits held by domestic commercial banks increases to 15 percent (from 8 percent).

October 22, 1991:

Liberalization of foreign investment regime (under Resolution 51) to expand existing guarantees and ease the way to new investment. Foreign firms allowed to remit up to 100 percent of net annual profits.

December, 1991:

Investors permitted to buy up to 100 percent locally listed companies. Abolition of restrictions on capital and income repatriation.

February, 1992:

a) Export surrender requirement proceeds eased: all exporters allowed to retain part of export proceeds abroad. Previously, this was granted only to coffee growers and to state enterprises exporting oil and minerals.

b) Residents allowed to hold foreign stocks and other foreign portfolio investments abroad up to $500,000. Higher amounts require approval of the National Planning Department.

February, 1992:

Minimum maturity on foreign loans reduced from five years with two years' grace, to one year. Such loans permitted only to finance working capital or fixed investment. Limit on contractual interest rate (London interbank offered rate (LIBOR) + 2.5 percent) eliminated for the private sector.

Sources: Conzalez (1995), Labán and Larraín (1994), and Schadler et al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 9b (Continued). Liberalization of Outflows: Latin America

Colombia (continued)

April, 1994:

a) Limits on foreign investments of domestic pension funds, insurance companies, and mutual funds were raised from 3 to 4 percent.

b) The share of export proceeds subject to surrender requirements was reduced from 90 to 85 percent and the period of surrender of foreign exchange was extended from 150 to 180 days.

October, 1994:

The share of export proceeds subject to surrender requirements was further reduced from 85 to 80 percent.

Mexico (1990)

November, 1991:

Abolished foreign exchange surrender requirements and related exchange control measures permitting unification of controlled and free market exchange rates.

Sources: Alfiler (1994), Banco de la Republica, Annual Report, various issues, Bank Negara, Annual Report, various issues, and Schadler et al. (1993).

Note: The date next to the country name denotes the first year of the surge in inflows.

Table 9a. Liberalization of Outflows: Asia

Malaysia (1989)

August, 1993:

The minimum amount of equity that must be held by an indigenous Malay group, company or institution was lowered from 51% to 35%.

Philippines (1992)

July, 1994:

a) Bangko Central raised the limit on outward investments sourced from the banking system from US$1 million to US$3 million.

b) Restrictions on repatriation of investments (and earning accruing therefrom) funded by debt-to-equity conversions under the old debt restructuring program are lifted.

Sri Lanka (1990)

1993:

Removal of limits on foreign currency working balances of commercial banks and a lower reserve ratio on foreign currency deposits to the extent that the funds were invested abroad.

Thailand (1988)

April, 1991:

Foreign exchange earners allowed to open foreign exchange accounts with commercial banks in Thailand up to $500,000 for individuals and $2 million for corporations. Thai investors could freely transfer up to $5 million abroad for direct investment. Bank of Thailand approval requirement of repatriation of investment funds eliminated.

February, 1994:

a) The amount of Thai baht that can be taken out to Vietnam and bordering countries was raised to B 500,000.

b) The ceiling on the amount of foreign exchange that can be taken abroad for travelling expenses was eliminated (the previous ceiling was US $20,000).

Sources: Hettiarachchi and Herat (1994), Nijathaworn and Dejthamrong (1994), and Schadler et al. (1993).
Note: The date next to the country name denotes the first year of the surge in inflows.

Table 4. Interest Rates and Sterilization Policies
(In Percent, Annual Rates)

	In domestic Currency		Converted into dollars			In domestic Currency		Converted into dollars	
CHILE					**INDONESIA**				
	Interest Rate on:					Interest Rate on:			
	30-89 days		30-89 days			Prime	90-day	Prime	90-day
	loans	deposits	loans	deposits		loans	deposits	loans	deposits
Pre-inflow:					Early inflow period				
1988:1-89:12	28.54	21.41	16.83	10.39	1989:1990:12	22.54	17.99	17.03	13.24
Capital inflows and heavy sterilization					Capital inflows and heavy sterilization				
1990:1:90:7	46.58	37.80	35.16	27.01	1991:1992:12	25.27	21.88	20.84	17.58
Capital inflows and heavy sterilization					Capital inflows and moderate sterilization				
1990:7-94:5	27.93	21.76	18.91	13.17	1993:1-1994:6	19.22	13.66	15.30	9.93
COLOMBIA					**MALAYSIA**				
	Prime Loans	Central Bank Paper	Prime Loans	Central Bank Paper		Deposits		Deposits	
Pre-inflow:					Early Inflow:				
1989:1-90	44.14	33.79	3.74	11.25	1989:1-91:6	6.21		5.52	
Capital inflows and heavy sterilzation					Capital inflows and heavy sterilization				
1991:1-91:11	47.16	42.08	10.31	18.85	1991:7-93:6	7.92		13.07	
Capital inflows and moderate sterilization					Moderate sterilization				
1991:12-93:12	36.95	24.31	11.08	20.53	and heavy foreign exchange intervention				
					1993:7-93:12	6.74		-4.87	
					Capital controls, currency appreciation				
					1994:1-94:6	5.30		18.19	

Source: Various central bank bulletins and Bloomberg.

Table 7. Exchange Rate Variability
(Variance of monthly exchange rate changes, in percent)

	Argentina (1991)	Chile (1990)	Colombia (1991)	Mexico (1990)	Indonesia (1990)	Malaysia (1989)	Philippines (1992)	Thailand (1988)
1988	54.18	0.91	0.05	0.56	0.07	0.65	0.21	0.40
1989	12788.58	2.66	0.01	0.01	0.07	0.80	0.16	0.41
1990	3768.23	2.22	0.07	0.07	0.03	0.17	6.16	0.27
1991	358.61 1/	1.22	0.05	0.02	0.02	0.76	0.58	0.37
1992	0.06	5.21	0.01	0.40	0.03	2.69	12.38	2.43
1993	0.07	0.76	0.01	0.09	0.02	2.95	6.43	0.15
1994	0.01	0.75	13.95	3.61	0.02	2.63	2.69	0.14

Source: International Financial Statistics, IFS.
Notes: The dates in parentheses indicate the year in which capital inflows began.
1/ Convertibility Plan begins in April 1991.

Table 10. Policy Mix in Response to the Capital Inflows

Country	Fiscal Restraint	Revaluation	Increased Exchange Rate Variability	Sterilized Intervention	Controls on Capital Inflows	Liberalization of Capital Outflows	Trade Liberalization Accelerated
Argentina	No 1/	No	No	No	No	No	No
Chile	Yes	Yes	Yes	Yes	Yes	Yes	No
Colombia	No	Yes	Yes	Yes	Yes	Yes	Yes
Indonesia	No	No	No 2/	Yes	Yes	No	No
Malaysia	Yes	No	Yes	Yes	Yes	Yes	Yes
Mexico	No 1/	No	No 2/	Yes	No 4/	Yes	Yes
Philippines	No	No	Yes 3/	Yes	No	Yes	No
Sri Lanka	No 1/	No	No 3/	Yes	No	No	Yes
Thailand	Yes	No	No	Yes	Yes	Yes	Yes

1/ Fiscal consolidation (including privatization efforts) were part of the inflation stabilization programs and not a response to the rise in capital inflows per se. The Convertibility Plan in Argentina begins in April 1991 while the Mexican plan predates the surge in inflows and begins on December 1987.
2/ Despite announcements of broader intervention bands, exchange rate variability does not change appreciably (see Section III of this chapter).
3/ The Philippines and Sri Lanka already had a relatively flexible exchange rate system at the start of the inflow episode.
4/ Caps on foreign currency liabilities of banks are not binding until 1994 (see Reinhart and Smith (1995)).